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Pakistan: Defense Industry Struggles for Self-Sufficiency

A Research Paper

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Pakistan: Defense Industry Struggles for Self-Sufficiency [REDACTED]

A Research Paper

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Pakistan: Defense Industry Struggles for Self-Sufficiency

Summary

*Information available
as of 28 September 1989
was used in this report.*

The Pakistani Government has consistently promoted the idea of self-sufficiency in conventional armament and will almost certainly continue working toward this goal under Prime Minister Bhutto. Several wars with India and arms embargoes by the West have persuaded Islamabad to rely on its own resources to the greatest possible degree. As a result, Islamabad has developed a defense industry that produces infantry weapons, munitions, and equipment. Public and private factories produce roughly one-fifth of the military's required arms and equipment and earn a modest amount of foreign exchange. Islamabad wants to increase the portion of arms made or coproduced in Pakistan because it believes its defense industry will gain technological expertise by building sophisticated foreign-designed items. In a short war with India, Pakistan's factories could produce much of the ordnance that its forces would require after they draw down peacetime stockpiles.

The armed services are expanding their ability to service and rebuild foreign-made tanks and aircraft. The capability to rebuild major weapons will almost certainly help insulate Pakistan from foreign pressures should a future war with India be prolonged. Pakistan has probably achieved significant economies through these programs and has earned foreign exchange and good will by rebuilding aircraft for other Muslim nations.

Islamabad has had less success developing advanced weapons—particularly tanks, combat aircraft, and missiles. Pakistan has a small pool of scientists and technicians available for research in conventional weapons and devotes only a small fraction of its defense budget to research and development. Pakistan will not be able to design and build its own tanks or combat aircraft in the foreseeable future.

Self-sufficiency probably suffers because of Pakistan's perceived need for military preparedness. Convinced that Pakistan must be able to repel an attack by India at a moment's notice, military planners have relied for more than three decades on large standing forces maintained at high levels of readiness. Given Pakistan's poor economy, the resources devoted to maintaining this force leave few for building the nation's defense-industrial base and research establishment. As a result, Pakistan's unimproved scientific and weapons research effort cannot develop sophisticated weapons without extensive foreign assistance.

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Pakistan's defense industry will increase the quantity and quality of weapons it produces over the next decade, but breakthroughs in manufacturing or development capabilities are not likely. The perennial problems of an overly bureaucratic management system and an underfunded research establishment undoubtedly will persist. As a result, the defense industry will continue to rely on foreign machinery and advanced technical knowledge. [REDACTED]

Pakistani officials are sure to seek coproduction and rebuilding facilities for US weapons already in Pakistan's arsenal and will argue for fewer restrictions on sales of high-technology equipment and processes for their defense industry. Islamabad does not have the capability to reverse-engineer sophisticated US-made weapons in its arsenal, such as the F-16. [REDACTED]

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Scope Note

This research paper draws largely on unclassified information, although some data are available only from [REDACTED] reporting. The general capabilities of Pakistan's defense industries are widely known from published sources, but there is a dearth of reporting on [REDACTED]

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Pakistan: Defense Industry Struggles for Self-Sufficiency

Pakistan has been committed to establishing an indigenous defense industry since independence in 1947. The partition of India left the new nation of Pakistan with only a fraction of the British Indian Army's weapons and no capacity to produce arms or ammunition. Pakistani decisionmakers quickly concluded that they needed at least a small domestic arms industry. Using surplus World War II machinery from the United Kingdom—some captured from Germany—the first facilities of the Pakistan Ordnance Factories (POF) were established in the early 1950s. The defense industry developed slowly over the next decade with assistance from the United States, the United Kingdom, and West Germany.

Two major wars with India reinforced the conviction held by Pakistani planners that national security depends on domestic production of military equipment. After the 1965 war, in which the United States and the United Kingdom embargoed arms to Pakistan, the Pakistanis turned to China for assistance in building their defense industry. The disastrous outcome of the 1971 conflict deepened Islamabad's reliance on China. With Chinese assistance, the Pakistanis in the 1970s built new arms factories and overhaul facilities for their Chinese-made tanks and aircraft.

The desire for an indigenous defense industry has survived every change of regime in Pakistan. Prime Minister Bhutto's new Minister of State for Defense, Ghulam Sarwar Cheema, sounded remarkably like the late President Zia's appointees when he told an interviewer in February that dependence on foreigners for arms—even for state-of-the-art weaponry—is unwise. According to Cheema, supplying countries could charge exorbitant prices or impose dangerous conditions. Cheema also worried that Western nations might use their leverage over Pakistan's military to force an unfavorable settlement of a conflict.

The Defense Industry in Pakistan's Economy

Pakistani decisionmakers justify the resources devoted to the defense industry by citing its benefits for the overall economy. Islamabad can point to jobs created and export sales as payoffs for the expense of seeking independence in armament. Defense plants have trained tens of thousands of skilled workers and managers. Some have transferred these skills to the private sector. Plants such as those run by the Pakistan Ordnance Factories also produce items—such as chemicals and machine parts—used by civilian industries.

We doubt that Pakistan has a comparative advantage in arms production. Considerable subsidization, as well as outright corruption, characterize the government's relationship with the defense industry. For example, few Pakistani businesses can match the security, pay, and benefits provided by the defense industry. Pakistan Ordnance Factories, in particular, has used this advantage to attract skilled employees. A recent article reports that Pakistani workers regard a job at POF as a "plum," probably acquired in part through political patronage. Many technicians spend their entire careers with the organization, having little incentive to work in the private sector. We believe subsidized salaries and benefits deplete the national treasury and deprive the private sector of manpower, money, talent and raw materials that could be more productively employed elsewhere.

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Pakistan's Military-Industrial Complex

Islamabad procures arms and equipment from several quasi-private organizations and about 800 private firms, according to press reports. The private firms are based mainly in Karachi and Lahore and tend to devote 30 to 50 percent of their overall business to defense production. Key institutions are:

- **Precision Engineering Complex, Karachi.** Controlled by Pakistan International Airlines—itself run by the Defense Ministry . . . [REDACTED]
[REDACTED] . . . located near Karachi's airport.
- **Pakistan Machine Tool Factory, Karachi.** Government owned, privately operated . . . established with Swiss assistance in early 1960s . . . advertises production of mortars, 106-mm recoilless rifles, RPG-7 rocket launchers . . . about 15 percent of its capacity used in arms production, according to press reports.
- **Heavy Industry Complex, Taxila.** Run by Ministry of Defense . . . includes Heavy Mechanical Complex, Heavy Forge and Foundry, and Heavy Rebuild Facility, where Army overhauls armored vehicles . . . manufactures machinery and metal parts for military and civilian uses, according to press reports . . . built by China in late 1970s.
- **Pakistan Automobile Corporation, Karachi.** Assembles Isuzu, Hino, and Suzuki cars and trucks for military and civilian use . . . begun in 1982.
- **National Radio Telecommunication Corporation, Haripur.** Built in 1960s . . . makes military radios, according to military periodicals.
- **Pakistan Railways, Lahore and Islamabad.** Lahore workshop makes mobile bridges for the Army . . . Carriage Factory in Islamabad makes tank transporter trailers.
- **Micro Electronics International, Lahore.** Makes tactical radios and cryptographic gear, [REDACTED] and may also have the capability to produce clones of IBM personal computers. Privately owned and operated.
- **Institute of Optronics, Rawalpindi.** Produces US-designed night-vision devices and laser range-finders, [REDACTED] . . . press reports indicate the institute is operated by the Defense Ministry.
- [REDACTED]

Defense Industry Goals

The defense industry can help insulate Pakistan from the effects of an arms embargo during a short, intense conflict with India—the type of war Islamabad considers most likely.¹ Although public and private firms produce only 20 percent of Pakistan's arms and

¹ We believe Islamabad projects a future conflict with India to unfold much like the West Pakistan campaigns of 1965 and 1971, with three to five weeks of intense combat ending in military stalemate and a diplomatic settlement. Pakistani planners probably expect to have declining access to foreign arms and raw materials as international pressure and Indian naval operations constrict the flow of supplies to Karachi over the course of the conflict. [REDACTED]

equipment, [REDACTED] its ordnance factories assemble or manufacture [REDACTED] the country's ammunition stocks. We believe that domestic plants—if they drew upon stockpiled raw materials and moved to 24-hour production—could make most of the large quantities of ordnance that Pakistani forces would need in wartime. In addition, Pakistani facilities can fabricate spare parts and perform most maintenance on major weapon systems such as tanks and combat aircraft. [REDACTED]

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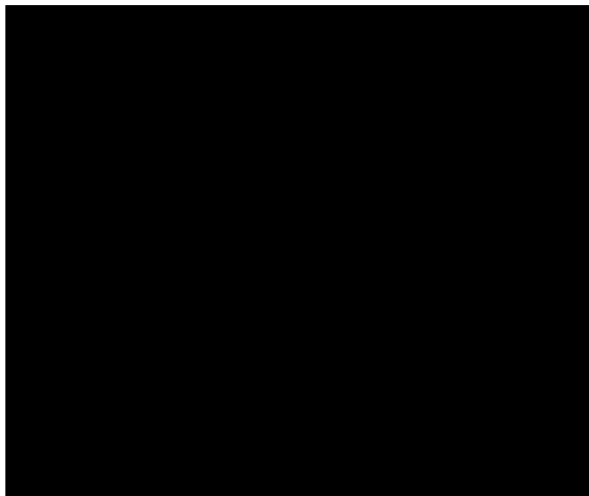


Figure 2. Lt. Gen. Talat Masood now runs the Military Technology Defense Production Division of the Ministry of Defense. He was formerly head of Pakistan Ordnance Factories.

Islamabad wants a defense industry that will contribute to the growth of Pakistan's military and civilian technological capability and productive capacity. Military journals report that the government expects that facilities established with foreign assistance will replace foreign advisers with Pakistani technicians as quickly as possible to ensure technological independence. Pakistani officials also take pride in their ability to modify and improve foreign-designed weapons—such as West German assault rifles—to suit Pakistani needs. Islamabad doubtless hopes the knowledge gained through producing weapons will bolster the military's research and development and be diffused into the larger economy over the long term.

Pakistani planners view the defense industry as a valuable source of foreign exchange, and Islamabad aggressively markets its arms and ammunition in the Third World. Cheema said in February that Islamabad saw a burgeoning market for arms among Third World states looking for reliable suppliers of cheap and relatively simple weapons such as small arms and ammunition.

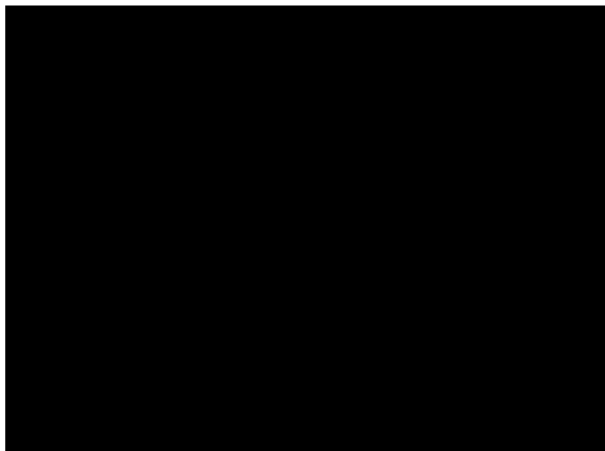
Pakistan Ordnance Factories exports of its production and has sold ammunition to nations in Asia and the Middle East.

POF earned about \$50 million from

Sales of Pakistani Armaments

Pakistan Ordnance Factories is aggressively seeking customers for its arms and ammunition. Islamabad hopes that low prices and a "no-questions-asked" sales policy will attract Third World countries. POF officials boast Pakistan has sold ammunition and infantry weapons to more than 30 countries. The list comprises mostly Middle Eastern and Asian nations, but the United States and France have also purchased Pakistani defense-related items, according to Islamabad.

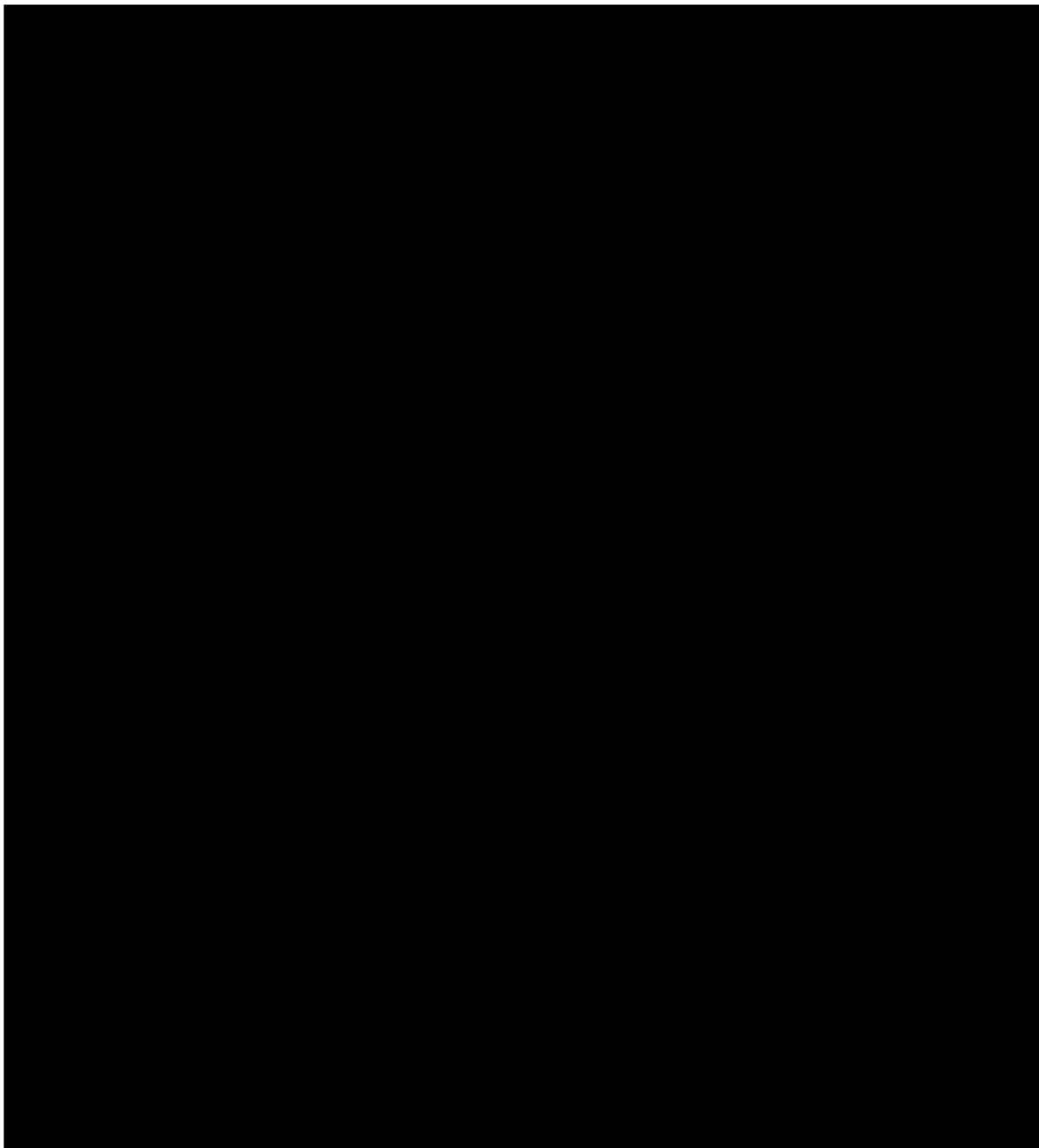
Users of Pakistani ammunition like its low cost but complain about its quality.



arms exports in 1985 and planned to triple this figure over the next few years. We believe, ~~APPROVED FOR RELEASE~~ export earnings fluctuate from year to year. ~~DATE: SEP 2000~~ not be increasing. Lt. Gen. Talat Masood, at the time

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head of POF, said the organization earned only \$35 million from exports in 1988, according to a press report. [REDACTED]

Islamabad also sees its defense industry as a foreign policy tool to cement old ties and forge new ones, but it recognizes that defense cooperation is only one part of a larger diplomatic equation. Pakistan has long enjoyed cordial relations with Turkey, for instance, [REDACTED]

[REDACTED] and press reports indicate Pakistan and Iran agreed in July 1989 to establish a joint ministerial commission to expand cooperation in defense production and military training. We believe Islamabad is trying to revive the close military ties between Pakistan and Iran that existed before the Iranian revolution and sees Pakistan's military production and overhaul capabilities as an incentive to improve relations. [REDACTED]

Production Decision Making

Pakistan's defense industry is under the overall control of the Ministry of Defense. The Secretary for Defense Production heads the Defense Production Division—the oversight body for Pakistan's arms factories, overhaul facilities, and research establishments.² Press reports indicate the division projects future procurement requirements and oversees both production and procurement of arms and equipment. [REDACTED]

² The current holder of this post is Lt. Gen. Talat Masood, who headed the Pakistan Ordnance Factories until mid-1988. [REDACTED]

[REDACTED]

Islamabad has long paid lipservice to the need to restructure the defense industry to spur greater efficiency and creativity, but it has done little to bring this about. Calls for a greater reliance on market incentives to allocate costs and production have been made by Pakistani officials for years. Talat Masood said in 1984 that Pakistan Ordnance Factories should be run more like commercial enterprises to spur innovation and allocate costs better. [REDACTED]

A recent article on the Pakistan Ordnance Factories stressed the organization's need for a more open, private-enterprise-like form of governance, implying the persistence of problems noted several years ago. [REDACTED]

Pakistani officials continue to urge private-sector investment in producing and marketing military items, but we doubt that private firms will produce a significantly larger share of Pakistani armaments. In July, Defense Secretary Cheema wooed businessmen

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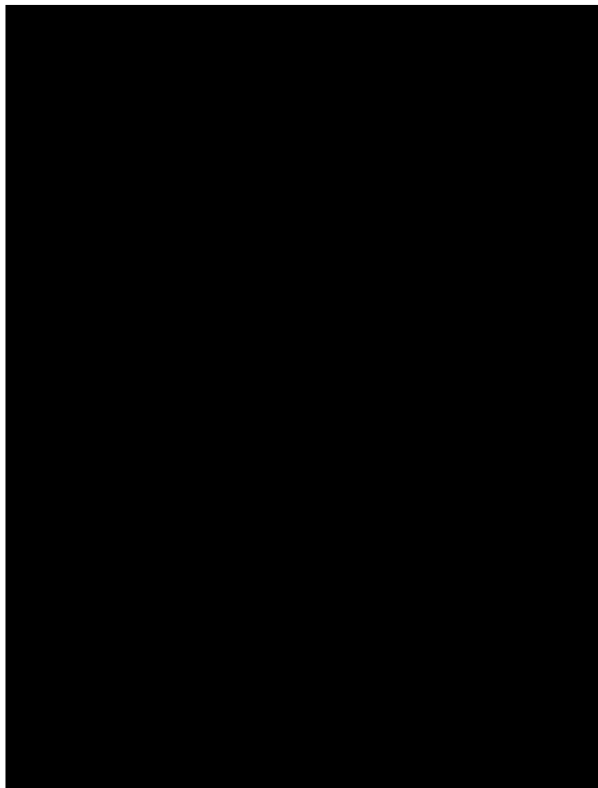


Figure 4. Several private and quasi-public Pakistani firms produce arms and military equipment. This is an advertisement for the Karachi-based Pakistan Machine Tool Factory.

at a seminar sponsored by the Karachi Chamber of Commerce, according to press reports. Nonetheless, private enterprises produce only 5 to 7 percent of the arms and equipment manufactured in Pakistan, according to press reports. Masood has publicly complained that bureaucratic obstacles and the uncertainty over the size and duration of orders discourage long-term business investment.

For their part, businessmen blame the difficulty of breaking into the industry. In a 1988 speech, the president of the Lahore Chamber of Commerce noted the numerous barriers to entry. A recent press article claimed the business sector's historically low levels of investment would also limit private defense production. We believe all of these problems contribute to the private sector's small share of defense production.

We estimate that the defense industry receives about 15 percent of the defense budget and a similar share of the military's foreign exchange allocation.³ This nearly equals the share India allocates for arms production and for weapons research and development, which allocation we estimate at 18 percent of New Delhi's much larger defense budget. Roughly half of Pakistan's defense industry funds go to POF, in our judgment. In 1977, the last year for which such numbers are available, 7 percent of Pakistan's defense budget went to POF.

We believe POF receives a similar share today. A recent press article stated that POF's budget was more than 3 billion rupees (\$150 million), but we believe the published figure excluded POF's foreign exchange allocations.

Pakistan plans to devote about 15 percent of its \$1.7 billion in US Foreign Military Sales (FMS) credits to its defense industry through US fiscal year 1993,

Islamabad signed a memorandum of understanding on defense production cooperation with the United States in 1984.

Pakistan hopes to spend some of its FMS funds on a facility to overhaul its US-made armored vehicles and on coproduction of M113A2 armored personnel carriers, TOW-2 antitank missiles, and various types of ammunition.

Production and Coproduction

Pakistan Ordnance Factories is the heart of the nation's defense industry. Although it is located at several sites, the organization's headquarters is in Wah, a company town that is home to most of the roughly 40,000 POF employees. A military journal reports POF treats its workers well by Pakistani standards, providing comparatively good pay and benefits. The employees repay POF's benevolent paternalism with loyalty. A recent press article reports that many skilled technicians and engineers spend their entire careers with the organization. Although

³ Pakistani officials that the military is allocated about \$1 billion in foreign exchange each year. The defense industry's foreign exchange allocation is probably about \$150 million, excluding whatever funds are earned through arms exports and maintenance of foreign aircraft.

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Pakistan Ordnance Factories

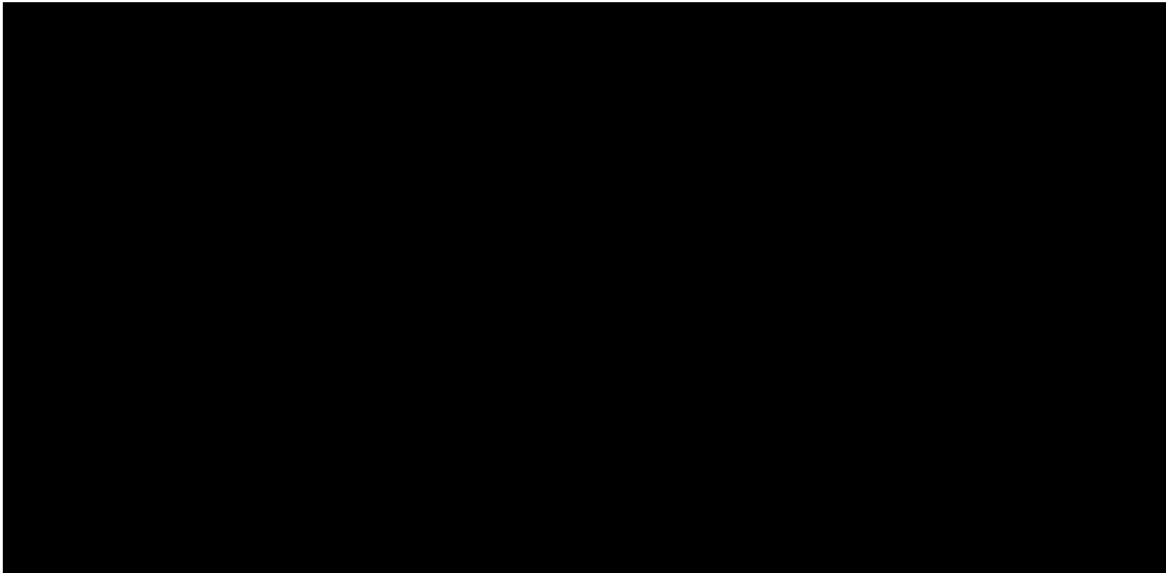
The government-owned Pakistan Ordnance Factories is the largest industrial enterprise in Pakistan. It controls 14 factories, employs roughly 40,000 workers, and produces \$400-500 million worth of products annually, according to press [REDACTED] reports. Most of the factories are at Wah Cantonment. Others are nearby in the Islamabad-Rawalpindi area. The POF complex includes:

- **Weapons Factory.** This facility has produced rifles and machineguns under license from Heckler and Koch of West Germany for more than 20 years. The Weapons Factory is POF's showcase, boasting computer-aided design processes and computer numerically controlled machinery.
- **Small-Arms Ammunition Factory.** Makes rifle and pistol rounds and rifle grenades. POF is acquiring a rotary ammunition plant from a US firm to replace the aging equipment in this facility.
- **Machinegun Factory.** This plant makes Type-54 12.7-mm machineguns under license from China, according to press reports.
- **Artillery Ammunition Factory.** Manufactures medium-caliber artillery ammunition, as well as grenades and aircraft bombs.
- **Tungsten Alloy Factory.** Uses computerized machinery to produce penetrators for the L64 105-mm tank round and a 100-mm round designed by POF.
- [REDACTED]
- **Heavy Ammunition Factory.** Produces artillery and mortar rounds, and fuzes for antitank rounds. The facility was built with Czechoslovak assistance but is installing computerized machinery. Located at Sanjwal.
- **Explosives Factory.** Two plants at Wah and Havelian make explosives for POF munitions.
- **Propellant Factory.** Produces about 1,200 tons of single-base and double-base ammunition propellant annually with Chinese assistance, according to press reports. Has static test stands for rocket motors and artillery. Located at Havelian.
- **Clothing Factory.** Makes uniforms for Pakistan's armed services. [REDACTED] the factory was being expanded and modernized in 1988.
- **Brass Mill.** Produces brass sheets and other components for ammunition manufacturing.
- **Filling Factory.** Manufactures explosives and assembles ammunition.
- **Woodworking Factory.** Makes boxes and crates for ammunition. [REDACTED]
- [REDACTED]
- **Tank and Antitank Ammunition Factory.** Produces tank and antitank munitions of 100 mm and larger, according to press reports. Located at Gadwal.

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Figure 5. The sprawling industrial complex at Wah is home to Pakistan Ordnance Factories and thousands of its employees. [REDACTED]

the lack of better opportunities in the private sector probably helps POF retain its skilled employees, we believe their loyalty is a key factor in POF's capabilities. [REDACTED]

POF is undergoing gradual expansion and modernization. It grew steadily during the last decade under Talat Masood, [REDACTED]

[REDACTED] * Press reports say POF's showcase plant, the Weapons Factory, recently attained greater capabilities and efficiency by installing computer numerically controlled machinery. Military journals report that other POF plants—which some observers have compared with Western facilities in efficiency and capabilities—are being modernized or expanded. In the last few years new capacity has been added at several plants, according to press reports. [REDACTED]

Several other public and quasi-private organizations produce weapons, equipment, and ammunition. The most modern is the Precision Engineering Complex in

Karachi, a government-run research organization and producer of weapons and electronic gear. Another is the quasi-private Pakistan Machine Tool Factory, also located in Karachi, which advertises its manufacture of mortars, recoilless rifles, and rocket grenade launchers. [REDACTED]

Virtually all of the weapon systems and equipment produced in Pakistan are made under coproduction agreements, according to open sources. Defense plants have licenses to manufacture or assemble a variety of products, including West German small arms; Swedish training aircraft, surface-to-air missiles, and air defense radars; Chinese Type-69II tanks and Red Arrow antitank missiles; and US night vision sights. The Heavy Rebuild Facility at Taxila will soon assemble 500 M113A2 armored personnel carriers under license from a US firm, according to press reports. [REDACTED]

* The new chairman of Pakistan Ordnance Factories is Maj. Gen. Sabih Qamar uz-Zaman. [REDACTED]

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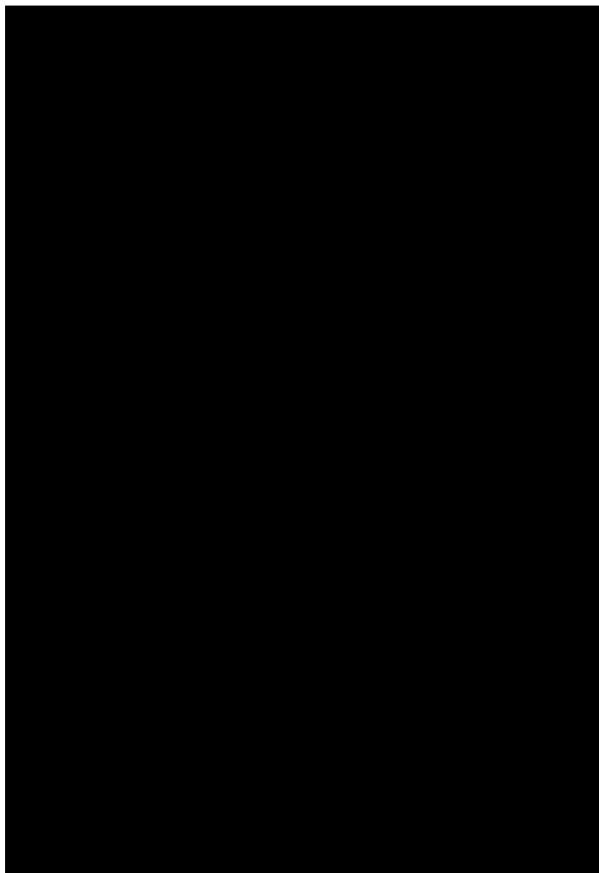


Figure 6. Pakistani firms have only recently begun to produce sophisticated electronic equipment, such as this night-vision device made with Western help by the Institute of Optonics. [REDACTED]

Coproduction has not been a complete success. In part because of a shortage of scientists and skilled technicians, Pakistan has not been able to translate the capabilities acquired in coproducing arms into an indigenous capability to develop and produce its own weapons. For example, Pakistan has produced Cobra antitank missiles since 1964 under West German license but has been unable to copy and improve upon the technology embodied in this obsolescent design. Pakistan's "new, indigenously produced" weapons—such as the Hatf short-range ballistic missile and the Anza surface-to-air missile—are copies or modifications of foreign systems and were probably produced with Chinese assistance. In addition, press reports



Figure 7. Production of tank ammunition at Pakistan Ordnance Factories. Western visitors have noted that the efficiency of POF facilities is usually comparable to that of US or West European arms plants. [REDACTED] Military Technology ©

indicate Islamabad has been disappointed by its inability to find foreign buyers of coproduced items, such as the MFI-17 trainer aircraft. [REDACTED]

Quality control is another problem, especially in items requiring a high degree of chemical expertise. [REDACTED]



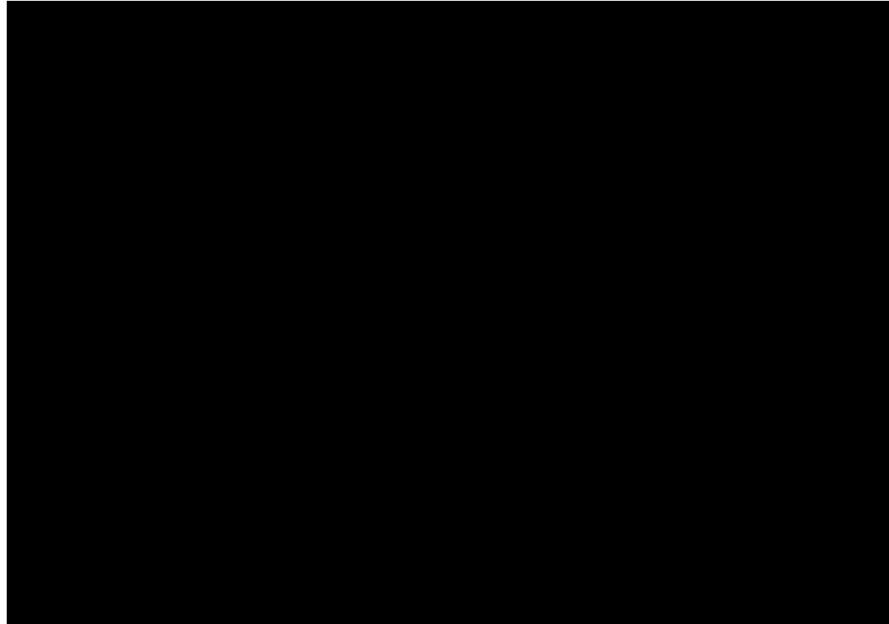
Pakistan has had to shop abroad for specialized munitions because domestic industry officials cannot guarantee high quality mass [REDACTED]

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Figure 8. The Army's tanks are maintained at the Heavy Industry Complex located near Taxila. These workers are gutting an M47 tank before converting it into an armored recovery vehicle. [REDACTED]



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production. [REDACTED] Pakistan purchased 5,000 105-mm M735 tungsten-penetrator tank rounds from the United States in the mid-1980s, even though POF had by then acquired a capability to make tungsten rounds. [REDACTED]

Rebuilding and Upgrading

Unable to overcome its dependence on foreign countries as suppliers of major weapons, Islamabad is seeking increased capabilities to maintain and modify them. Repairs to foreign weapons are costly and time consuming when performed in the country of origin. Pakistani officials have publicly claimed that overhauling Chinese-made aircraft in China routinely takes 18 months. We believe Pakistan saves considerable sums by overhauling tanks and combat aircraft itself. Press reports indicate Pakistani officials hope to save \$182 million by rebuilding their fleet of Chinese-made aircraft. The overall proficiency of Pakistan's

rebuilding facilities is attested to by the fact that Islamabad earns needed foreign exchange by rebuilding aircraft for several Arab nations.¹ [REDACTED]

The Heavy Rebuild Facility at Taxila was built with Chinese assistance to overhaul the Army's Chinese-made Type-59 tanks. The plant has rebuilt about 900 tanks since 1979, making or reclaiming most of the required parts, [REDACTED]

[REDACTED] the Army initially disliked the idea of a central tank overhaul facility, preferring to perform the work in the armor garrisons, but the quality of Taxila's work has convinced armor officers of the plant's usefulness. [REDACTED]

¹ In 1988 Pakistan beat three European competitors to win a contract with the United Arab Emirates to rebuild that nation's 26 Mirage fighters, according to press reports. [REDACTED]

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Islamabad is investing \$150 million to expand the Taxila plant to overhaul and upgrade its US-made tanks, self-propelled artillery, and armored personnel carriers, [REDACTED]. The proposed schedule calls for the new facility to be operating by mid-1990. [REDACTED]

[REDACTED] The plant is designed to overhaul about 100 US-made "M-series" armored vehicles annually, [REDACTED]

For several years Islamabad has advertised plans to upgrade most of its early-model Type-59 tanks with 105-mm guns and modern sights and fire-control systems, but we doubt this project—which would be performed at Taxila—is imminent. In the mid-1980s, Pakistan sought bids for upgrade packages from Western and Chinese firms and held an inconclusive firing competition among the four team entries in July 1987. Islamabad did not select a contractor to upgrade its tanks, however, [REDACTED]

The Pakistan Aeronautical Complex at Kamra overhauls French- and Chinese-built combat aircraft, as well as manufacturing MFI-17 trainers under Swedish license, according to open sources. The facility was originally established under the CENTO treaty to repair Pakistan's US-made F-86 and F-104 interceptors, which have long since been retired. The organization is now rebuilding 24 Chinese-made aircraft annually, and it makes many of the components used in aircraft overhauls. Pakistan plans to rebuild its Chinese-made F-7 interceptors at Kamra and, eventually, even F-16s, [REDACTED]

The Army and Navy operate other overhaul and upgrade facilities. The Navy's Karachi dockyard overhauls Pakistan's warships and assembled several minisubmarines purchased as kits from Italy in 1987, [REDACTED]

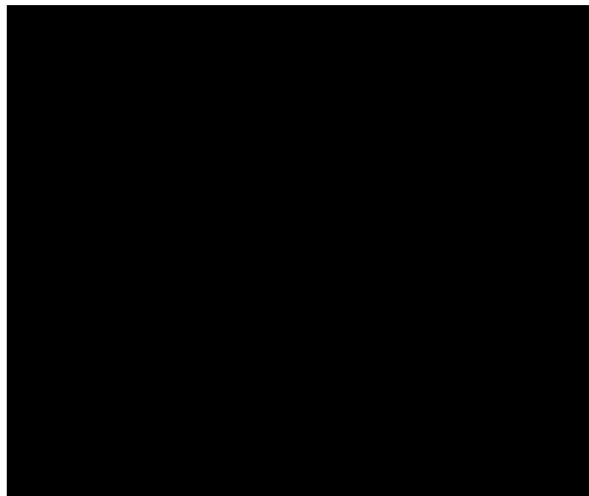


Figure 9. The Pakistan Aeronautical Complex at Kamra maintains the Air Force's French- and Chinese-made combat aircraft. Here technicians are overhauling F-6 interceptors. [REDACTED]

[REDACTED] Press reports claim Islamabad plans to build Western-designed warships there as well, [REDACTED]

The Army operates an overhaul facility for helicopters in Rawalpindi. [REDACTED]

Research and Development

In contrast to the modest proficiency of Pakistan's arms production and rebuilding efforts, the Pakistanis have accomplished little in their research and development. Virtually all work is conducted by government-run institutions—the foremost is the Defense Science and Technology Organization (DESTO). Other research organizations, such as Khan Research Laboratories, also engage in research and development work on conventional weapon systems, apparently independent of DESTO. [REDACTED]



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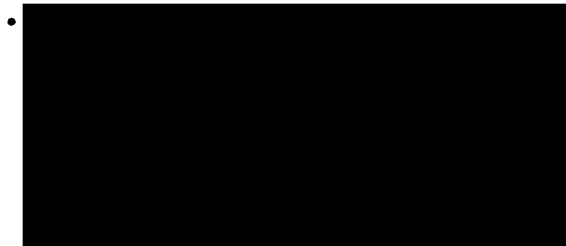
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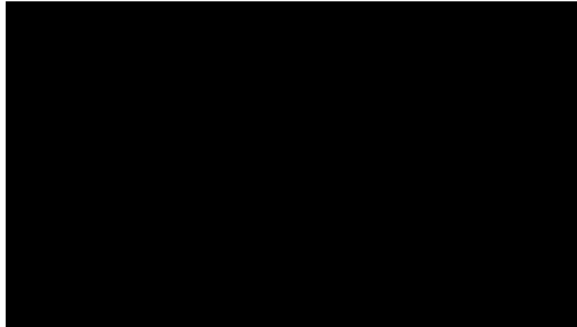
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Pakistani Research and Development Organizations ^a

- **Defense Science and Technology Organization (DESTO).** Created in 1963, DESTO has three applied science laboratories located in Karachi and the Islamabad area. Most of its projects involved reverse-engineering of foreign weapons and equipment. [REDACTED] The small size of the organization's staff prevents it from effectively designing and developing products for mass production. [REDACTED]
- **Space and Upper Atmosphere Research Commission (SUPARCO).** This entity was formerly part of DESTO but now answers directly to the Defense Ministry. [REDACTED] Its primary military mission is developing rockets and rocket propellants, and its crowning effort to date has been the Hatf missile, which may soon be placed in series production. SUPARCO also makes chaff dispensing rockets and electronic countermeasures gear for the Navy and rockets for the Air Force. It is headquartered in Karachi and operates a test range near Sonmiani. [REDACTED]
- **Khan Research Laboratories.** Dr. A. Q. Khan recently told a Pakistani publication that his facility has ventured beyond nuclear-related activities to reverse-engineer the Chinese HN-5 surface-to-air missile and develop other military hardware such as laser rangefinders and unspecified antitank weapons. [REDACTED]



^a All of these organizations are owned and operated by the Pakistani Government. [REDACTED]



In 1988-89, Islamabad's development efforts achieved several minor successes. Khan Research Laboratories finally began producing its version of the Chinese HN-5 man-portable surface-to-air missile system and presented the first production copies to the Army with great fanfare. [REDACTED] several Pakistani innovations at a recent military parade, including M113 armored personnel carriers fitted with Chinese-designed HN-5 antiaircraft missiles and Red Arrow antitank missiles and a truck-mounted copy of the Soviet BM-21 multiple rocket launcher, called the Azar. [REDACTED]

Despite recent successes, there are serious shortcomings in Pakistan's ambitious research and development effort. For example, Islamabad wants to manufacture its own main battle tank [REDACTED] Pakistani defense officials call the tank the MBT-2000 and indicate it will have a 120-mm gun, excellent armor, high speed, and an advanced fire-control system. [REDACTED]

[REDACTED] Moreover, Western countries ordinarily take more than a decade to develop main battle tanks. Although Talat Masood has said publicly that Pakistan would develop the tank in partnership with a European or Chinese firm, the characteristics of the MBT-2000, such as high speed with sophisticated armor, would demand production and design capabilities that Pakistan does not have. [REDACTED]

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Pakistan and China are developing a jet training aircraft called the Karakorum-8—or L-8 in China—but are encountering problems and delays [REDACTED]

[REDACTED] Press reports claim the aircraft will replace the Air Force's aging T-33, FT-5, and FT-6 trainers. [REDACTED]

The meager success of Pakistani efforts stems from Islamabad's apathy toward indigenous research and development, in our judgment. The problem has several aspects:

- Pakistan has a poor scientific and technical education establishment. Although a few Pakistani scientists and technicians have been trained in the West, there is no school to train Pakistani defense scientists and engineers. [REDACTED]

- Islamabad spends little money on research. A recent press article reported that Pakistan devotes 0.4 percent of its annual defense budget to research and development. We believe this figure is roughly accurate [REDACTED]

[REDACTED] resulting in annual spending on research and development of less than \$20 million. By comparison, official Indian figures indicate the Indian military spent 4.7 percent of its budget—about \$430 million—on research and development in its 1988/89 fiscal year.

- Pakistani commentators publicly note a perennial resistance to research in the military and insensitivity to the needs and advice of scientists. We believe Islamabad's penchant for concentrating weapons research and development in government agencies may stifle innovation and risk taking on the part of Pakistani scientists and engineers. [REDACTED]

Figure 10. Pakistan's "new" weapons are actually reverse-engineered or modifications of foreign-designed systems. Shown above is Dr. A. Q. Khan of Khan Research Laboratories presenting Chief of Army Staff Beg with the first production copy of Pakistan's version of the Chinese-made HN-3 surface-to-air missile (itself a copy of the Soviet SA-7). [REDACTED]

Preparedness at the Expense of Self-Sufficiency

Pakistanis are convinced they must be ready to repel an attack from India at a moment's notice, a conviction dictating a policy of constant preparedness. To deter New Delhi, Islamabad relies on large standing forces maintained at high levels of readiness and a nuclear weapons program. Moreover, the resource drain is worsened, in our judgment, by Islamabad's goal of achieving a qualitative edge over India's numerically stronger forces by acquiring expensive, state-of-the-art weapons. [REDACTED]

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Why Do Pakistan's Defense Industries Lag Behind India's?

India began its existence as a nation in 1947 with large stores of arms and the core of a modern defense industry left behind by the United Kingdom. Only after the 1965 Indo-Pakistani war did Pakistan seek to expand the capabilities of its small defense industry. By that time India had a lead over Pakistan that it has not relinquished.

India's larger scientific community, combined with farsighted policies, did much to ensure its superiority over Pakistan in defense production. As early as the 1950s, it placed more emphasis on technical and scientific education than did Pakistan. In addition, Pakistani officials have publicly noted that India has long spent a greater percentage of its much larger defense budget on research. India has produced and deployed serviceable (although not state-of-the-art) aircraft and warships, and it is developing ballistic missiles and a new tank. Pakistan is far behind in all of these areas.

India's defense industry has also benefited more from foreign allies than has Pakistan's. Indian factories produce a variety of Soviet weapons, including the relatively modern MiG-27 fighter-bomber and T-72 tank.

Only in recent years has Islamabad turned to the West for the capability to coproduce major sophisticated weapons.

We believe self-sufficiency suffers from Pakistan's perception of imminent peril. The resources devoted to purchasing foreign weapons and maintaining a standing military have been diverted from the task of building the defense industry and research establishment. The military has been forced to choose between purchases of foreign arms and investment in the defense industry. The perceived need to match Indian acquisitions has outweighed the desire to build up domestic production. Finally, the nation's most talented scientists and engineers are almost certainly drawn

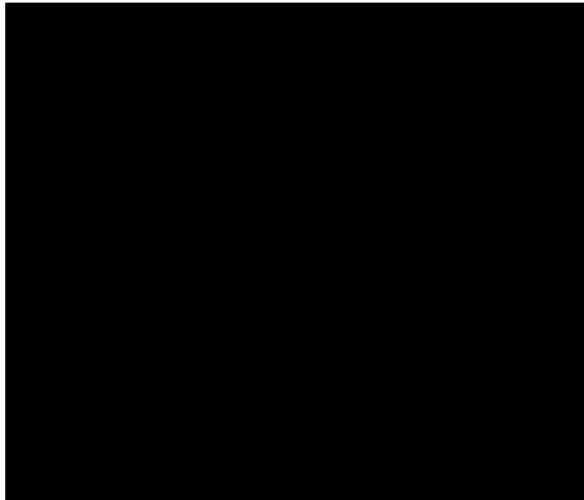


Figure 11. Pakistani arms plants are making increasing use of computers for product design and manufacturing.

into nuclear weapons and ballistic missile development programs rather than developing conventional weapons.

Outlook and Implications

Over the next decade Pakistan will increase the output and perhaps expand the variety of light arms and equipment produced by its defense industry. In doing so, we believe Islamabad will continue purchasing foreign-made machinery and make greater use of computers for design work and other tasks. Pakistan will almost certainly continue to allocate between 10 and 20 percent of its military budget to the defense industry. With expanded output and the savings from modernized and more efficient production techniques—as well as expanded capabilities to rebuild and upgrade foreign-made weapons—Islamabad should gain more independence in armament.

Nevertheless, the defense industry is likely to continue to face many of the problems it has today:

- Entrenched bureaucracies in the Ministry of Defense, armed services, and defense industry will resist reforms that impose greater accountability or provide a larger share of funds to the private sector.

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- Pakistan's research and development establishment is weak and will remain so, and Pakistan is unlikely to be able to build its own major weapon systems or to reverse-engineer sophisticated foreign-made weapons.
- Competition from other Third World countries that can match Pakistan in price and quality will limit Islamabad's sales beyond its present customers.

As a result, we believe Pakistan's defense industry will not look much different at the turn of the century. Islamabad will be able to take satisfaction in gaining somewhat more independence from foreign suppliers. Nevertheless, we believe Pakistan will pay a price—in direct costs as well as higher prices for weaponry and reduced output in the civilian sector—for this modicum of success.

Pakistani planners will continue to seek US assistance in developing their defense industry, as well as training at US defense plants. We believe Islamabad will

aggressively seek US-built weapons and equipment because West European countries rarely offer credits and assistance as good as those offered under the US Foreign Military Sales program. Islamabad, in our judgment, will also seek additional coproduction arrangements and US assistance in enabling Pakistanis to repair and service US weapons in country.

Islamabad will probably seek the most capable US-made equipment available. Pakistanis are likely to protest proposed export controls on US manufacturing machinery and capabilities, arguing that Pakistan is a good security risk and that it is in Washington's interest to promote a strong Pakistani military. We do not believe Pakistan will be able to reverse-engineer sophisticated US-made weapons, such as the F-16 aircraft or the Harpoon missile.

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